Assignment No.4

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Download latex-tikz codes from

https://github.com/Panisha707/ASSIGNMENT04/blob/main/main.tex

Download python codes from

https://github.com/Panisha707/ASSIGNMENT04/blob/main/untitled26.py

Question taken from

linear_form, exercises 2.3,i,j

1 Question No 1

Draw the graphs of the following equations

$$a)\begin{pmatrix}1 & 1\end{pmatrix}\mathbf{x} = 0 \tag{1.0.1}$$

$$b)\begin{pmatrix}1 & -1\end{pmatrix}\mathbf{x} = -2 \tag{1.0.2}$$

2 Solution

a) there is no constant in the line equation thus it passes through the origin

put $\mathbf{x} = \begin{pmatrix}-1\\ y\end{pmatrix}$ in equation

$$\begin{pmatrix}1 & 1\end{pmatrix}\begin{pmatrix}-1\\ y\end{pmatrix} = 0 \tag{2.0.1}$$

$$\implies y = 1 \tag{2.0.2}$$

$$\mathbf{P} = \begin{pmatrix}0\\ 0\end{pmatrix}, \mathbf{Q} = \begin{pmatrix}-1\\ 1\end{pmatrix} \tag{2.0.3}$$

b) put $\mathbf{x} = \begin{pmatrix}x\\ 0\end{pmatrix}$

$$\begin{pmatrix}1 & -1\end{pmatrix}\begin{pmatrix}x\\ 0\end{pmatrix} = -2 \tag{2.0.4}$$

$$\implies x = -2 \tag{2.0.5}$$

put $\mathbf{x} = \begin{pmatrix}0\\ y\end{pmatrix}$

$$\begin{pmatrix}1 & -1\end{pmatrix}\begin{pmatrix}0\\ y\end{pmatrix} = -2 \tag{2.0.6}$$

$$\implies y = 2 \tag{2.0.7}$$

$$\mathbf{A} = \begin{pmatrix}-2\\ 0\end{pmatrix}, \mathbf{B} = \begin{pmatrix}0\\ 2\end{pmatrix} \tag{2.0.8}$$

Graphs of the equations (a) and (b) are constructed by using python as

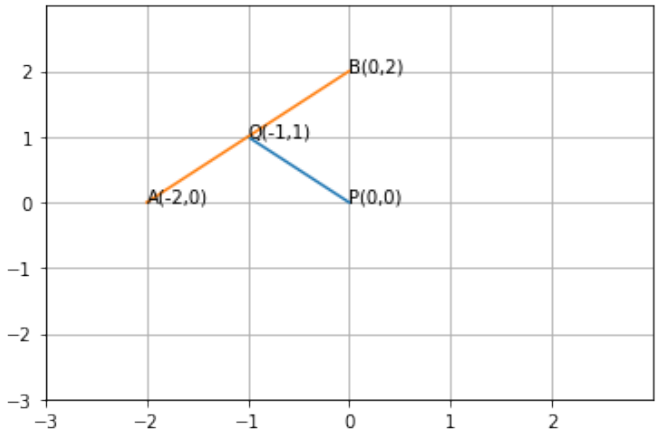

Fig. 2.1: Graphs of Equations (a) and (b)